PISCINE PROSPECTING: FISH INVENTORIES IN YUKON-CHARLEY RIVERS NATIONAL PRESERVE

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INTRODUCTION

The Alaska Freshwater Fish Inventory (AFFI) program was established by the Alaska Department of Fish & Game (ADF&G) in 2002. Tasked with documenting freshwater fish species assemblages throughout the state, this program's annual inventories are a major contributor to ADF&G's "Catalog of Waters Important for the Spawning Rearing or Migration of Anadromous Fishes," also known as the Anadromous Waters Catalog (AWC). Alaska state law affords special protection to lakes and rivers that support anadromous fish species under the Anadromous Fish Act (Alaska Statute 16.05.871). Qualifying water bodies are recorded in the AWC. There are physical maps and an online mapping application of the AWC that specify the location and extent of water bodies that are documented by ADF&G to support anadromous fishes and are therefore protected by state law. *Anadromous* describes a life history strategy where fish are born in freshwater, migrate to the ocean as juveniles, then return to fresh water to spawn as adults. Well known species of anadromous fishes in Alaska are the five species of Pacific salmon, but there are at least 21 species of anadromous fishess documented in Alaska including Dolly Varden *Salvelinus malma* and Inconnu *Stenodus leucichthys*. These inventory efforts also document the various freshwater resident fish species such as Round Whitefish *Prosopium cylindraceum*, Longnose Sucker *Catostomus catostomus*, Northern Pike *Esox lucius*, and Burbot *Lota lota*. Some Alaskan fish species have variable life histories where one drainage supports populations of both freshwater resident and anadromous life histories such as Dolly Varden, Rainbow Trout *Oncorhynchus mykiss*, and Inconnu.

Each year AFFI staff identify a project area with a high concentration of water bodies with limited or no fish-distribution information. Typically, helicopters are used to access remote areas where rapid, systematic fish inventories are performed using multiple gear types including electrofishers, minnow traps, seines, and angling. Data on aquatic and riparian habitats are also gathered at each site. Ultimately, the information collected is added to the AFFI database and streams found to support anadromous fish species are nominated to the AWC. All collected data are available through an interactive mapping application available on the ADF&G website at http://www.adfg.alaska.gov/index.cfm?adfg=ffinventory.interactive. The mapper is updated every June.

2019 PROJECT BACKGROUND

In 2019, the Alaska Sustainable Salmon Fund funded AFFI staff to collaborate with the National Park Service (NPS) to work out of Coal Creek Camp and sample fishes in streams within or tributary to Yukon-Charley National Preserve (YUCH), a park in far eastern interior Alaska along the upper Yukon River. This area is important to inventory because it contains known spawning habitats of Chinook Salmon *Oncorhynchus tshawytscha* and Chum Salmon *O. keta*, but it has relatively limited documentation of juvenile Chinook Salmon rearing habitat. This area not only serves as a corridor for migrating spawning salmon and habitat for rearing juvenile salmon but also supports subsistence fishers who rely on harvesting these (and other) fishes in eastern Alaska and the Yukon Territory, Canada. Thus, knowing the distribution of all age classes of salmon in this area can more accurately portray how the landscape contributes to salmon species of commercial and subsistence importance.

Photos by the authors.

Nate Cathcart, Habitat Biologist II, ADF&G Division of Sport Fish, Anchorage. Mr. Cathcart joined the AFFI program in 2018 and served as the program's Fish & Wildlife Technician III for two field seasons prior to promotion to his current position as project biologist in October 2019. Earning a Bachelor's degree from Colorado State University and a Master's degree from Kansas State University, Mr. Cathcart has a variety of research experience from studying Razorback Sucker and Colorado Pikeminnow migrations in the Colorado River Basin to quantifying logjam use by juvenile Chinook Salmon in Alaska. He has published and co-authored several articles for fisheries journals and brings a wealth of field and technical research experience to the AFFI program.

Joe Giefer, Habitat Biologist III, ADF&G Division of Sport Fish, Anchorage. Mr. Giefer was hired into the AFFI program in October 2013 but has participated as a crew member during multiple AFFI surveys since 2005. He has 15 years of experience as a Habitat Biologist with the Division of Sport Fish. He has a Bachelor's degree in Fisheries and Wildlife Biology from Utah State University. Mr. Giefer is currently the project biologist for the department's Anadromous Water Program and supervisor for the AFFI programs project biologist.

Both authors are from Minnesota, just south of the Twin Cities.

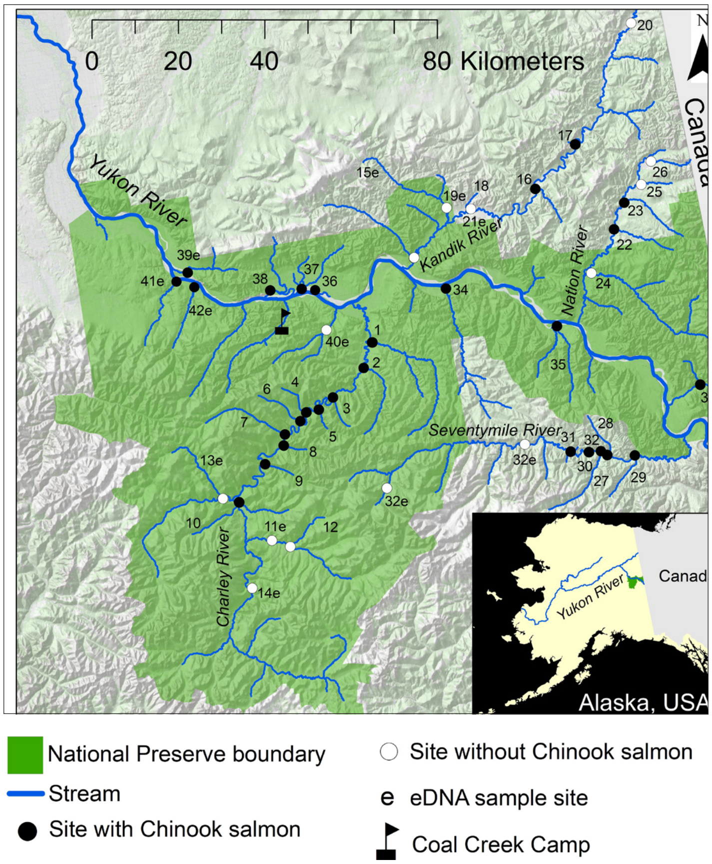

Figure 1. Study area and surveyed sites of Yukon-Charley National Preserve and surrounding drainages that Alaska Freshwater Fish Inventory program staff sampled in August 2019. Site numbers correspond to waterbodies in Tables 1, 2, and 3.

STUDY AREA AND HISTORY

Excluding the Yukon River upstream of the border with Canada, the YUCH portion of the 2019 study drains 7,728 mi² of the upper Yukon River basin (Figure 1). The study area landscape was within the Yukon-Tanana Uplands and is largely made up of low, rolling mountains, although the headwaters of the Charley River drain peaks of the Ogilvie Mountains that exceed 5,000 ft tall. Spruce forest underlain by permafrost is interspersed across boggy lowlands, especially within the Yukon River corridor. This study involves rivers within and accessible by YUCH including the Yukon and its smaller tributaries, totaling 1,837 mi² of drainage, Charley (1,728 mi²), Kandik (1,186 mi²), Nation (950 mi²), Tatonduk (1,379 mi²), and Seventymile (648 mi²). Some streams and watersheds herein had been previously sampled by aerial surveys, telemetry, and minnow trapping but lacked extensive spatial coverage in many areas, especially on tributaries to the Charley, Seventymile, and Yukon rivers (Daum and Flannery 2011; Johnson and Blossom 2019). Although the border of YUCH ends at its mouth, the Seventymile River was included in this report because anadromous fishes using this watershed must travel through YUCH. Similarly, sites on tributaries to streams flowing through YUCH yet outside its border, such as those on tributaries of the Nation and Kandik rivers are also included.

Our study area is rich in history that continues to unfold today. This project occurred within the ancestral territories of two native North American Athabascan groups: the Gwich'in and the Han. The name "Gwich'in" generally translates as "people who live at a certain place," with most Gwich'in bands specified by a landmark or feature, such as a specific river, whereas Han translates as "people of the [Yukon] River." Artifacts indicate human occupation over 4,000 years ago within YUCH but nearby areas of the upper Yukon River drainage have ancient Athabascan sites dated in excess of 14,000 years ago (Buvit and Rasic 2011). Early use and eventual settlement of this region is thought to have occurred due to the unglaciated Yukon River being an important travel corridor to access productive hunting areas (Buvit and Rasic 2011).

Euro-American trappers and traders did not arrive until the mid-1800s, but their pioneering legacy inspired mining and entrepreneurship at the turn of the century. In the 1890s along the Yukon River, the thick spruce forests interwoven with rocky streams near the Alaskan-Canadian border served as the backdrop for the Klondike gold rush that spilled over into Alaska (Allan 2015). The landscape that sustained people with fish, game, and forage for millennia was transformed into booming, short-lived communities of prospectors seeking the earth's riches. The rush dissipated, causing most miners to abandon the area and, if still willing, to chase rumors of gold elsewhere.

Today, this land supports far less people than it did 120 years ago, yet vestiges of past prospecting remain among the wilderness. In 1980, the Alaska National Interest Lands Claim Act (ANILCA) was signed into law by President Jimmy Carter, creating YUCH among many other conservation units managed by the NPS, Bureau of Land Management, and the Fish & Wildlife Service (National Park Service 2012). Some larger-scale gold mining operations, such as at Coal Creek Camp, continued into the 1980s (Allan 2015). In 1980, not only did ANILCA create YUCH, but the United States Congress designated the entire Charley River watershed (1.1 million acres) as part of the National Wild and Scenic Rivers System. Now, the YUCH and surrounding river corridors are strongholds for Peregrine Falcon, Caribou, and Dall Sheep while still supporting gold mining, subsistence fisheries (where fishwheels and gillnets target anadromous salmon and migratory whitefish), and outdoor recreation such as rafting (National Park Service 2012).

METHODS

Using ArcMap GIS software, we defined two stream size classes based on upstream drainage (catchment) area: "headwater" stream sites that drain an approximately 20 mi² (50 km²) catchment and "un-wadeable" stream sites that drain an approximately 77 mi² (200 km²) catchment. From these two classes, downstream points are created, which are used as target sample sites and prioritized depending on the amount of potential mileage that could be added to the AWC. Headwater sites are wadeable streams where backpack electrofishing is used whereas un-wadeable streams require raft-mounted electrofishing to sample. Often, tributary sites were sampled near confluences with larger rivers because they have been demonstrated to be productive areas for juvenile salmon catch (e.g., Kiffney et al. 2006). Due to weather (i.e., high water events from rainfall) and low sampling effectiveness due to absence of adult spawning salmon, effort was primarily performed at

Figure 2. Electrofishing large woody debris in a side channel of the Seventymile River, just upstream of the confluence of Kesha Creek (in the background to the right).

Figure 3. Dolly Varden from Effrain Creek, tributary to the Nation River.

Figure 4. Longnose Sucker captured from Crooked Creek, a tributary to the Seventymile River.

Figure 5. Round Whitefish sampled in Cooper Creek, a tributary of the Kandik River.

headwater sites by two crews. The two raft sites presented here are the Charley River (site 14) and the Kandik River (site 21).

When sampling via the raft-mounted electrofisher, the crew would float one stream a day and continuously sample for several miles. The headwater crew(s) visited four to eight sites and sampled a 500 to 1,000 ft (150 to 300 m) stream reach at each site (Figure 2). Fishes captured via electrofishing were identified to species, measured to fork length, photographed if necessary, and released. AFFI staff also recorded baseline habitat data at each target stream and took photos of the sample reach. Habitat data included a suite of riparian and geomorphic habitat measurements as well as water quality parameters. These variables provide a qualitative and quantitative assessment of the sample locations and provide some information about the habitat quality for various fish species and life history requirements (i.e., size of stream substrates, pH, presence of large wood for cover, or water temperature). For simplicity, this report highlights dominant habitat types associated with streams containing juvenile Chinook Salmon. The categories we used involved in-stream or bankside variables that provide cover for fishes including large woody debris such as logjams or fallen trees (L), beaver dams (B), overhanging vegetation that enters the water (O), and stream margins that may have slower velocity but no overhead cover (M). More detailed habitat data are available in the online database.

The AFFI field crew was based in Coal Creek Camp from August 13–24, 2019. This old mining camp has several cabins and a large kitchen house that support research, maintenance, and general enjoyment of the area. Wood stoves (and generously supplied firewood) heated each cabin, and the kitchen had an impressive propane stove and griddle to accommodate as much coffee and wild blueberry-infused pancakes necessary to sustain the crew. A road approximately one mile long connected the cabin area with the landing strip where the helicopters parked. One method of public access to this area is available from a trail starting at the mouth of Coal Creek where it meets the Yukon River.

Figure 6. Landing zone at the confluence of Erickson Creek and the Charley River in Yukon-Charley National Preserve.

Figure 7. The confluence of Happy Birthday Creek with the Yukon River.

Figure 8. The confluence of Bryant Creek with the Seventymile River.

RESULTS

We sampled nine species and collected 12 eDNA samples across 42 sites within YUCH boundaries or that were accessible by waters flowing through YUCH (Tables 1–3). Thirty-one of these sites (74%) supported juvenile Chinook Salmon and were nominated for inclusion in the AWC (n = 26). Data from streams that were not nominated provided supporting evidence for streams nominated prior to this study (Figure 1). Other common fishes were Arctic Grayling *Thymallus arcticus* (76% of sites occupied) and Slimy Sculpin *Cottus cognatus* (71%). On the other end of the spectrum, Dolly Varden (Figure 3) and Lake Chub *Couesius plumbeus* were the rarest species, each occurring at one site. Other resident fishes encountered included Longnose Sucker (Figure 4) and Round Whitefish (Figure 5). When Chinook Salmon were present, available in-stream habitats most often included large woody debris (n = 21 sites) in the form of logjams or large singular pieces of wood such as downed trees in Essie, Threesheep, or Bryant creeks. High flows during portions of this study prevented or altered sampling effort in some streams and probably factored into some captures of juveniles Chinook Salmon occurring in stream margins (e.g., Tindir and Waterfall creeks).

DISCUSSION

Juvenile rearing habitat for Chinook Salmon is well distributed throughout YUCH-area streams ranging from small streams flowing into tributaries such as the Charley or Seventymile rivers, to larger tributary habitats themselves, and including waters flowing directly into the Yukon River. Tributary reaches near confluences were productive areas for documenting presence of juvenile Chinook Salmon (Figures 6–8). Confluence habitats have been focal points to effectively tar-

Figure 9. Large woody debris and logjams in Dewey Creek, tributary to the Charley River.

Figure 10. Logjam in Erickson Creek, tributary to the Charley River.

Figure 11. Aerial view of Flat Creek flowing into the Charley River. Note the in-stream wood recruitment in Flat Creek shown by trees falling into the river.

get juvenile salmon in many studies (e.g., Ebersole et al. 2006, Kiffney et al. 2006, Daum and Flannery 2011) and can provide resources different from adjacent mainstem or distant tributary locations (Rine et al. 2016). Also, large woody debris, typically in the form of logjams, were coincident with Chinook Salmon presence (Figures 9–11). These features have been shown to provide important habitat for juvenile salmon elsewhere in the Yukon River drainage (Mossop and Bradford 2004). Logistical constraints (e.g., cost, time) associated with point sampling used during this survey prevent more accurate and extensive documentation of upstream distributions. For future surveys we suggest expanding sampling upstream. At a minimum, eDNA samples should be collected to provide evidence of salmon presence upstream of sampling locations and to guide future sampling efforts that focus on extending distributions upstream.

Even being in a relatively confined area of the Yukon River's Chinook Salmon, the variation in juvenile stream occupation and coloration was apparent. Although large woody debris habitats were a common habitat for juvenile Chinook Salmon regardless of stream type, these fish occupied small (~3yd wetted width) streams that were barely flowing in early July to large rivers tributary to the Yukon River such as the Seventymile River. These streams ranged from tumbling clear water draining rugged mountains and limestone cliffs to tannic meanders flowing out of lowland bogs near the Yukon River. Stream types seemed to have some role in the appearance of juvenile Chinook Salmon where some fish from tributaries farther away from the glacial silt of the Yukon River appeared to have more color, especially in the fins, compared to more silvery (shiny, pale) individuals captured at tributary sites near the Yukon River such as Eureka and Washington creeks (Figures 12–18).

AFFI sampling timing, locations, and methods probably had a large effect on the fish sample composition. Sampling occurred after local peak Chinook Salmon migration in late July but before fall Chum Salmon migration in mid to late September (e.g., McDougall and Lozori 2018). Additionally, local reports of lamprey (probably Arctic Lamprey *Lampetra camtschatica*) at the mouth of the Kandik River lend evidence to the possibility of other anadromous fishes in the area (Cathcart, personal communication). However, the presence of these lamprey occurs during early summer, also outside the AFFI sampling period. Further, AFFI sampling of smaller tributaries failed to collect any ammocoetes, suggesting we were not in areas near lamprey spawning grounds. The failure to collect other rare species or those absent from AFFI collections was likely due to isolated or patchy distributions, such as Dolly Varden in the Yukon River Basin (Bozeman and Grossman 2019) as well as failing to sample all available habitat types effectively (e.g., mainstem river habitats that support other species in the area such as Inconnu). Indeed, Bradford et al. (2008) sampled mainstem Yukon River habitats near the Alaskan-Canadian border throughout growing seasons (May-August) across three years and noted the presence of several fishes that AFFI staff did not capture: Arctic Lamprey, juvenile Chum Salmon, Inconnu, Least Cisco *Coregonus sardinella,* Broad Whitefish *C. nasus*, and Humpback Whitefish *C. pidschian*. Additionally, Bradford et al. (2008) showed that seasonal changes in mainstem captures of juvenile Chinook Salmon and Chum Salmon occurred. Their findings suggest AFFI sampling was much later than peak downstream migrations of juvenile Chum Salmon en route to the ocean (May-June), and that peak downstream migrations of juvenile Chinook Salmon in June may be a critical period for dispersal of individuals to non-natal tributaries of the YUCH area.

Figure 12. Juvenile Chinook Salmon from Bonanza Creek, tributary to the Charley River.

Figure 13. Juvenile Chinook Salmon from Highland Creek, tributary to the Charley River in Yukon-Charley Rivers National Preserve.

Figure 14. Juvenile Chinook Salmon from the Seventymile River, tributary to the Yukon River.

Although this study added several new waterbodies to the AWC, future work should use these existing data as a guide toward exploring different sampling periods and different habitats, as well as use of emergent techniques to more fully address assess fish distributions in this area. Sampling earlier may allow a greater likelihood of documenting juvenile Chum Salmon (May to June), spawning Chinook Salmon (July), and lamprey (June). Sampling later may allow a greater likelihood of documenting spawning Chum Salmon (late September). Sampling mainstem habitats may gather more information on rare species associated with larger waterbodies while sampling farther upstream in tributaries can provide more accurate species distribution data and extend habitat in the AWC. Additional information is pending regarding the findings from the eDNA sampling (sample processing has been delayed due to COVID-19 restrictions). These results, along with 2019 AFFI findings, can guide future sampling in waters where eDNA indicates presence of Pacific salmon but AFFI sampling failed to collect individuals. Similarly, drone technology is another emergent technique to explore broader spatial scales and assess salmon spawning presence in remote, logistically challenging environments (e.g., Groves et al. 2016). This project, while effective in documenting anadromous fishes in smaller streams, is not the definitive document of fish distributions in this area. By conducting sampling in different habitats, at different times, with various methods, resource managers can accurately assess the importance of this area to a seasonally dynamic fish community and its users, including subsistence fishers.

ACKNOWLEDGMENTS

We are grateful for the conceptual, logistical, and/or material support from Mat Sorum (NPS), Trey Simmons (NPS), and Gillian O'Doherty (ADF&G). Field work was conducted with the assistance of helicopter pilots Luke Fledderman (Coastal Heli-

Figure 15. Juvenile Chinook Salmon from Bryant Creek, tributary to the Seventymile River.

Figure 16. Juvenile Chinook Salmon from Henry Creek, tributary to the Kandik River.

Figure 17. Juvenile Chinook Salmon from Washington Creek, tributary to the Yukon River.

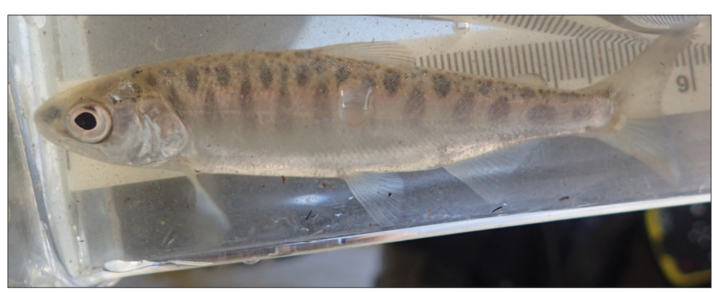

Figure 18. Juvenile Chinook Salmon from Eureka Creek, tributary to the Yukon River.

copters) and Eryk de la Montaña (Quicksilver Air) along with the crew: Donald "Donnie" Arthur (ADF&G), Maxwell Newton (NPS), Phill Stacey (ADF&G), and Lisa Stuby (ADF&G). Duncan Green, C. Ruffing, and R. Ch'bwanis facilitated essential gear and personnel logistics. Field, navigation, and postseason mapping production was assisted by ADF&G GIS analysts Jason Graham, Chet Murphy, and Ivy Schultz. We appreciate permitting and logistical assistance from the NPS and United States Fish & Wildlife Service. Funding for this project was provided by the Alaska Sustainable Salmon Fund (AKSSF), the National Fish and Wildlife Foundation, State Wildlife Grants (SWG), and State Fish and Game funds. Any use of trade names does not imply endorsement.

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Table 1. August 2019 sampling sites within or accessible through Yukon River tributaries of Yukon-Charley National Preserve. Species codes are: Arctic Grayling (AG), Burbot (BB), Northern Pike (NP), Chinook Salmon (CS), Lake Chub (LC), Longnose Sucker (LS), Round Whitefish (RW), and Slimy Sculpin (SS). Asterisk (*) indicates waterbody nominated to the Anadromous Waters Catalog for juvenile Chinook Salmon rearing habitat. Superscript E ([E]) indicates eDNA samples were also taken in the creek upstream of where electrofishing was conducted. Habitats for sites with Chinook Salmon are denoted by superscript L (large woody debris), B (beaver dams), O (overhanging/submerged vegetation), and M (stream margins).

Number	Stream	Drains into	Latitude	Longitude	AG	BB	NP	CS	LC	LS	RW	SS
1	*[L]Bonanza Cr.	Charley	65.23313	-142.72217	x	x		x				x
2	*[L]Flat Cr.	Charley	65.18417	-142.78624	x			x				x
3	*[L]Todd Cr.	Charley	65.13438	-142.96021	x			x				x
4	*[L]Erickson Cr.	Charley	65.11288	-143.10258	x			x				x
5	*[L]Drayham Cr.	Charley	65.11440	-143.03893		x		x				x
6	*[L]Dewey Cr.	Charley	65.09716	-143.13766	x			x				x
7	*[L]Hanna Cr.	Charley	65.07494	-143.22374				x				x
8	*[B]Highland Cr.	Charley	65.05275	-143.23837	x			x				x
9	*[L]Essie Cr.	Charley	65.02055	-143.34308				x				x
10	*[L]Threesheep Cr.	Charley	64.95056	-143.49855	x			x				x
11	[E]Copper Cr.	Charley	64.86198	-143.37016	x	x				x		x
12	Godge Cr.	Charley	64.84319	-143.28597								x
13	[E]Crescent Cr.	Charley	64.96390	-143.57454								
14	[E]Charley R.	Yukon	64.77067	-143.50199								x

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Table 2. August 2019 sampling sites within or accessible through Yukon River tributaries of Yukon-Charley National Preserve. Species codes are: Arctic Grayling (AG), Burbot (BB), Northern Pike (NP), Chinook Salmon (CS), Lake Chub (LC), Longnose Sucker (LS), Round Whitefish (RW), Slimy Sculpin (SS), and Dolly Varden (DV). Asterisk indicates waterbody nominated to the Anadromous Waters Catalog for juvenile Chinook Salmon rearing. Two asterisks indicate only one juvenile Chinook Salmon was caught, thus preventing nomination to the AWC. Dagger indicates 2019 data provided supporting information to a pre-existing juvenile rearing Chinook Salmon waterbody within the AWC. Superscript E (^{E}) indicates eDNA samples were taken in the creek upstream of where electrofishing was conducted. For the Seventymile River, eDNA samples were taken at sites without concurrent fish sampling: upper (N 64.92998 W -142.77310), and middle (N 64.96980 W -142.07018). Habitats for sites with Chinook Salmon are denoted by superscript L (large woody debris), B (beaver dams), O (overhanging/submerged vegetation), and M (stream margins).

Number	Stream	Drains into	Latitude	Longitude	AG	BB	NP	CS	LC	LS	RW	SS	DV
15	*^{EL}Threemile Cr.	Kandik	65.39149	-142.44771	x			x					
16	*^{O}Cooper Cr.	Kandik	65.48775	-141.79031	x			x			x		
17	**^{M}Henry Cr.	Kandik	65.56366	-141.55328	x			x			x	x	
18	Easy Moose Cr.	Kandik	65.46599	-142.14824	x								
19	^{E}Judge Cr.	Kandik	65.48235	-142.24364	x							x	
20	Little Cod Cr.	Kandik	65.78896	-141.16217	x	x						x	
21	^{E}Kandik R.	Yukon	65.47083	-142.12502	x					x	x		
22	†^{M}Waterfall Cr.	Nation	65.37482	-141.44157	x			x				x	
23	*^{M}Tindir Cr.	Nation	65.42529	-141.36676	x			x				x	
24	Hard Luck Cr.	Nation	65.29487	-141.59360									
25	Effrain Cr.	Nation	65.45556	-141.26648	x							x	x
26	Jungle Cr.	Nation	65.49913	-141.19643									
27	*^{O}Mogul Cr.	Seventymile	64.92718	-141.70935				x				x	
28	*^{L}Crooked Cr.	Seventymile	64.91738	-141.68166	x			x		x	x	x	
29	*^{L}Bryant Cr.	Seventymile	64.90550	-141.54955	x	x		x				x	
30	*^{L}Kesha Cr.	Seventymile	64.92988	-141.76791	x			x				x	
31	*^{O}Little Washington Cr.	Seventymile	64.93785	-141.85524	x			x				x	
32	*^{EL}Seventymile R.	Yukon	64.92770	-141.71220				x					
33	*^{L}Pass Cr.	Tatonduk	65.02429	-141.16879	x			x				x	

Table 3. August 2019 sampling sites within or accessible through Yukon River tributaries of Yukon-Charley National Preserve. Species codes are: Arctic Grayling (AG), Burbot (BB), Northern Pike (NP), Chinook Salmon (CS), Lake Chub (LC), Longnose Sucker (LS), Round Whitefish (RW), and Slimy Sculpin (SS). All streams flow directly into the Yukon River. Asterisk indicates waterbody nominated to the Anadromous Waters Catalog for juvenile Chinook Salmon rearing habitat. Dagger indicates 2019 data provided supporting information to a pre-existing juvenile rearing Chinook Salmon waterbody within the AWC. Superscript E ([E]) indicates eDNA samples were also taken in the creek upstream of where electrofishing was conducted. Habitats for sites with Chinook Salmon are denoted by superscript L (large woody debris), B (beaver dams), O (overhanging/submerged vegetation), and M (stream margins).

Number	Stream	Drains into	Latitude	Longitude	AG	BB	NP	CS	LC	LS	RW	SS
34	*[L]Washington Cr.	Yukon	65.31730	-142.31697	x	x	x	x	x	x		x
35	†[B]Michigan Cr.	Yukon	65.19904	-141.80899	x			x		x		x
36	*[L]Happy Birthday Cr.	Yukon	65.35795	-142.96413	x			x				
37	*[L]Andrew Cr.	Yukon	65.36742	-143.02448	x			x				x
38	*[B]Edwards Cr.	Yukon	65.37522	-143.18034	x		x	x				x
39	*[EL]Eureka Cr.	Yukon	65.43864	-143.57248	x	x		x				
40	*[E]Sam Cr.	Yukon	65.27475	-142.93678	x			x				
41	†[EL]Thanksgiving Cr.	Yukon	65.42388	-143.63479	x			x				x
42	†[EL]Webber Cr.	Yukon	65.40554	-143.55025	x			x			x	